

REMARKS

I. PRELIMINARY REMARKS

Claims 1-6, 12, 13, 23 and 24 have been amended.¹ Claims 7-11 have been canceled. No claims have been added. Claims 1-6 and 12-25 remain in the application. Reexamination and reconsideration of the application, as amended, are respectfully requested.

Applicant notes with appreciation that the Examiner indicated that claims 11, 12 and 23-25 have been objected to. As independent claim 1 has been rewritten to recite the combination of elements previously recited in claim 11, including the intervening claims, and claims 12 and 13 have been amended so as to depend from claim 1, applicant respectfully submits that claims 1-6, 12 and 13 are in condition for allowance. Similarly, as claim 23 has been rewritten in independent form and claim 24 has been amended so as to depend from claim 23, applicant respectfully submits that claims 23-25 are in condition for allowance.

II. PRIOR ART REJECTION

A. The Rejection

Claims 1-10 and 13-22 have been rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Pub. No. 2003/0138685 to Jankowski ("the Jankowski publication"). Applicant respectfully submits that the rejection of claims 1-10 and 13 has been rendered moot by the amendments to claims 1-6 and 13 and the cancellation of claims 7-11. The rejection of claims 14-22 under 35 U.S.C. § 103 is respectfully traversed. Reconsideration thereof is respectfully requested.

¹ Applicant respectfully submits that such amendments do not raise new issues and should be entered in accordance with 37 C.F.R. § 1.116(a) and MPEP 714.12 and 714.13.

B. Differences Between the Claimed Inventions And the Fuel Cell Structures Disclosed in the Jankowski Publication

Independent claim 14 calls for a combination of method steps including, *inter alia*, the steps of “defining an elongate fuel chamber in the thin-film substrate” and “operably securing an elongate proton exchange membrane-electrode assembly, having an anode and cathode, to said substrate and adjacent to said elongate fuel chamber.” The respective combinations defined by claims 15-17 include, *inter alia*, the steps recited in claim 14.

Independent claim 18 calls for a combination of elements comprising “a substrate defining a plurality of elongate fuel chambers with respective elongate fuel chamber openings” and “a plurality of elongate fuel cells, including respective anodes and cathodes, secured to the substrate and positioned over respective elongate fuel chamber openings such that the anodes face the elongate fuel chambers and the cathodes are hydraulically isolated from the elongate fuel chambers.” The respective combinations defined by claims 19-22 include, *inter alia*, the elements recited in claim 18.

The Jankowski publication fails to teach or suggest the claimed combinations. For example, the Jankowski publication includes a variety of fuel cell structures with a plurality of what appear to be **square** fuel chambers.² With respect to the anode-electrolyte-cathode structures, the Jankowski patent appears to either disclose a large **single square** anode-electrolyte-cathode structure that is associated with all of the fuel chambers (Figure 3), or an anode-electrolyte-cathode structure that is associated with a single fuel chamber (Figures 2, 5 and 8) and has a **corresponding shape**.

C. The Impropriety of a Conclusion of Obviousness Based Solely on a Citation to MPEP § 2144.04 IV

The Office Action has taken the position that reconfiguring the Jankowski fuel chambers and anode-electrolyte-cathode structures would have been an obvious matter of design choice and, in support, has cited MPEP § 2144.04 IV, which in turn

² See, for example, Figure 3 and the last two lines of paragraph 0030; Figure 5 and paragraph 0038; and Figure 7.

cites *In re Daily*, 149 USPQ 47 (CCPA 1966).³ It should be noted that with respect to citations to cases listed in the MPEP § 2144.04, the MPEP clearly indicates that the Examiner may only use the rationale used by the court “**if the facts** in a prior legal decision **are sufficiently similar** to those in an application under examination.” [Emphasis added.] Moreover, “[i]f the applicant has **demonstrated the criticality** of a specific limitation, it would **not be appropriate to rely solely on case law** as the rationale to support an obviousness rejection.” [Emphasis added.]

Applicant respectfully submits that the citation to MPEP § 2144.04 IV and, by inference, the *Daily* case is inappropriate for a number of reasons. First, the facts of the present application are not similar to those presented in the *Daily* case. Second, applicant has clearly demonstrated the criticality of the limitations at issue.

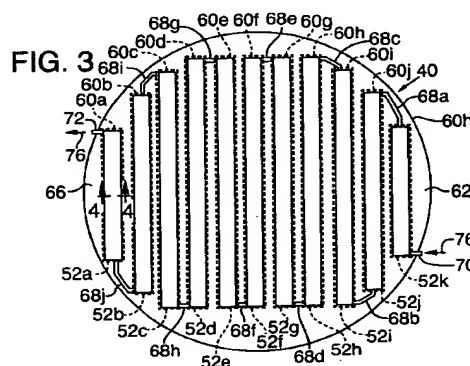
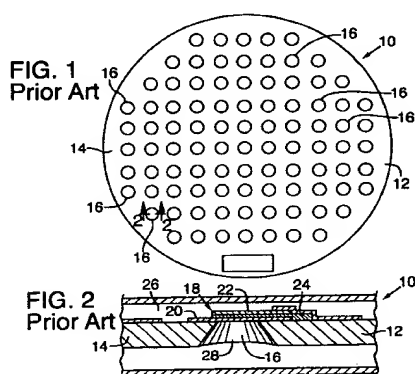
1. The Differences Between the Facts of the *Daily* Case and Those of the Present Application

The facts of the *Daily* case are readily distinguishable from the present situation. The invention in *Daily* was a nursing container that included a top section with a nipple opening, a bottom section that collapses as fluid leaves the container, and a nipple. The collapsibility of the bottom section, which prevented air from entering the container as liquid was drained from the container, was the key feature of the container. Such a container was, however, shown in a prior art reference. The claims that are relevant to MPEP § 2144.04 IV further indicated that the mating surfaces of the top and bottom sections of the container were a portion of a sphere less than a hemisphere, and that the spherical portions had central angle of about 80°. Although these shapes were not present in the prior art reference, the CCPA indicated that the applicant “presented no argument which convinces us that the particular configuration of their container is **significant** or is anything more than one of numerous configurations a person of ordinary skill in the art would find obvious for the purpose of

³ It is not entirely clear that the relevant portion of the almost 40 year-old *Daily* case is still good law. See, for example, *In re Kotzab*, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000) (“Even when obviousness is based on a single prior art reference, there must be a showing of a suggestion or motivation to modify the teachings of that reference.”).

providing mating surfaces in the collapsed container of [the prior art reference]." 149 USPQ at 50, *emphasis added*.

The admitted differences between the Jankowski fuel cell designs and the claimed combinations are, on the other hand, extremely significant and the present application goes to great lengths to explain the significance. Referring to Figures 1 and 2, which are reproduced below, the present application includes a discussion of a prior art design with non-elongate (i.e. "cup-shaped") fuel chambers 16 and correspondingly-shaped anode-electrolyte-cathode structures (i.e. PEMs 24). [See page 2, lines 24-32 of the specification.]



The specification identifies a number of shortcomings of the design illustrated in Figures 1 and 2. In particular, the page 3, lines 1-10 of specification identify the following four shortcomings of the prior art design:

- (1) "the amount of PEM 24 surface area available to interact with the fuel is limited,"
- (2) "it is difficult and time consuming to initially manufacture,"
- (3) it is difficult to "consistently fill a plurality of cup-shaped chambers 16 with fuel," and
- (4) "[i]t is also difficult to ensure uniform flow through all of the available cup-shaped chambers 16 during operation."

Applicant respectfully submits that the non-elongate fuel cell designs illustrated in the Jankowski publication would present the same problems when a plurality of the fuel cells are employed, and the Examiner has failed to provide any evidence that this is not the case. The inventions defined by independent claims 14 and 18, which call for an elongate fuel chamber (or chambers) and an elongate anode-electrolyte-cathode structure (or fuel cells) as are illustrated for example in Figure 3 above, obviates or

minimizes each of the shortcomings associated with the non-elongate fuel cell designs.

With respect to shortcoming (1), the claimed configurations result in far more surface area being available for fuel interaction on a substrate of the same size than does the design illustrated in the Jankowski publication. The Examiner has taken the position that "the concept of increasing the surface area of an electrode to increase current output is well known in the art and is not considered to represent an inventive step or an unexpected result."⁴ Even assuming for the sake of argument that "the concept of increasing the surface area of an electrode to increase current output is well known in the art," the Office Action failed to provide any of the other evidence that would support a conclusion of obviousness based on this statement. For example, the Office Action did not provide any evidence that it would be obvious to increase the total surface area of Jankowski electrodes without increasing the size of the underlying substrate, which is one benefit of the present elongate fuel chambers and elongate fuel cells combination. Nor did the Office Action provide any evidence that would have led one of skill in the art to increase the total surface area of Jankowski electrodes through the use of elongate fuel chambers and fuel cells. Clearly, the only methods of increasing the total surface area of Jankowski electrodes that the Jankowski publication arguably could have suggested would be increasing the size of the fuel chambers and fuel cells and/or increasing the density of the fuel chambers and fuel cells on the substrate. The only suggestion for the claimed combinations of an elongate fuel chamber (or chambers) and an elongate anode-electrolyte-cathode structure (or fuel cells) comes from the present application.

Concerning shortcoming (2), the claimed configurations are easier to manufacture than design illustrated in the Jankowski publication because the claimed configurations require far fewer individual fuel chambers and fuel cells to be manufactured on a substrate of the same size. Turning to shortcoming (3), the claimed configurations result in far fewer fuel chambers that must be filled on a substrate of the same size and, therefore, reduces the likelihood of inconsistent filling, as compared to the design illustrated in the Jankowski publication. Similarly, with respect to shortcoming (4) the claimed configurations result in far fewer fuel chambers through

⁴ The "unexpected result" issue is discussed below in Section II-D.

which fuel will flow on a substrate of the same size and, therefore, increases the likelihood that there will be consistent flow through all of the fuel chambers, as compared to the design illustrated in the Jankowski publication.

Accordingly, applicant respectfully submits that the differences between the inventions defined by independent claims 14 and 18 and the Jankowski fuel cell designs are not insignificant to the overall inventions, as was the case with the *Daily* mating surfaces. Rather, the differences between the inventions defined by independent claims 14 and 18 and the Jankowski fuel cell designs are significant differences which produce significant beneficial results. For this reason alone, the reliance on MPEP § 2144.04 IV is inappropriate.

2. Applicant Has Demonstrated the Criticality of the Limitations at Issue

As discussed at length in the preceding section, the elongate fuel chamber (or chambers) and elongate anode-electrolyte-cathode structure (or fuel cells) limitations are critical aspects of the overall invention. Interestingly, this was not the situation in the *Daily* case, where the critical limitation was the collapsibility of the bottom section of the container, not the shape of the mating surfaces of the top and bottom sections. The Office Action's application of MPEP § 2144.04 as the sole basis for the purportedly obvious modification of the Jankowski design is, therefore, in conflict with the MPEP's admonition that "[i]f the applicant has **demonstrated the criticality** of a specific limitation, it would **not be appropriate to rely solely on case law** as the rationale to support an obviousness rejection." [Emphasis added.] For this additional reason, the reliance on MPEP § 2144.04 IV is inappropriate.

D. A Showing of Unexpected Results Is Not Required Where The Office Action Fails to Establish a *Prima Facie* Case of Obviousness

The Office Action makes several references to unexpected results. In view of the Office Action's failure to establish a *prima facie* case of obviousness, applicant

respectfully submits that a discussion of secondary considerations of nonobviousness, such as unexpected results, is premature.

E. Other Issues Raised by the Office Action

Applicant also notes that the Examiner appears to have taken the position that if claimed combination of elements together provide a significant improvement over the prior, but do not (in the eyes of the Examiner) provide as much of an improvement as one of the specific embodiments in applicant's specification, then the improvement over the prior can simply be ignored in an obviousness analysis. [Office Action at page 4.] This position is respectfully traversed. Applicant hereby requests that the Examiner provide support for this position (e.g. MPEP, case law, etc.) in any subsequent Office Action in order to clarify the outstanding issues.

F. Conclusion

In view of the foregoing, applicant respectfully submits that the Jankowski publication fails to create a *prima facie* case of obviousness with respect to independent claims 14 and 18 and that the rejection of claims 14-22 under 35 U.S.C. § 103 should be withdrawn.

III. CLOSING REMARKS

In view of the foregoing, it is respectfully submitted that the claims in the application are in condition for allowance. Reexamination and reconsideration of the application, as amended, are respectfully requested. Allowance of the claims at an early date is courteously solicited.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is respectfully requested to call applicant's undersigned representative at (310) 563-1458 to discuss the steps necessary for placing the application in condition for allowance.

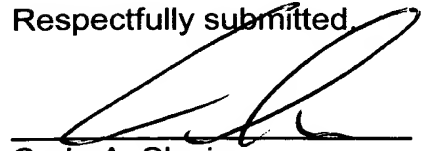
The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 08-2025. Should

such fees be associated with an extension of time, applicant respectfully requests that this paper be considered a petition therefor.

1/26/05
Date

Henricks, Slavin & Holmes LLP
840 Apollo Street, Suite 200
El Segundo, CA 90245
(310) 563-1458
(310) 563-1460 (Facsimile)

Respectfully submitted,



Craig A. Slavin
Reg. No. 35,362
Attorney for Applicant